Early Galaxy Clustering Measurements in SV data

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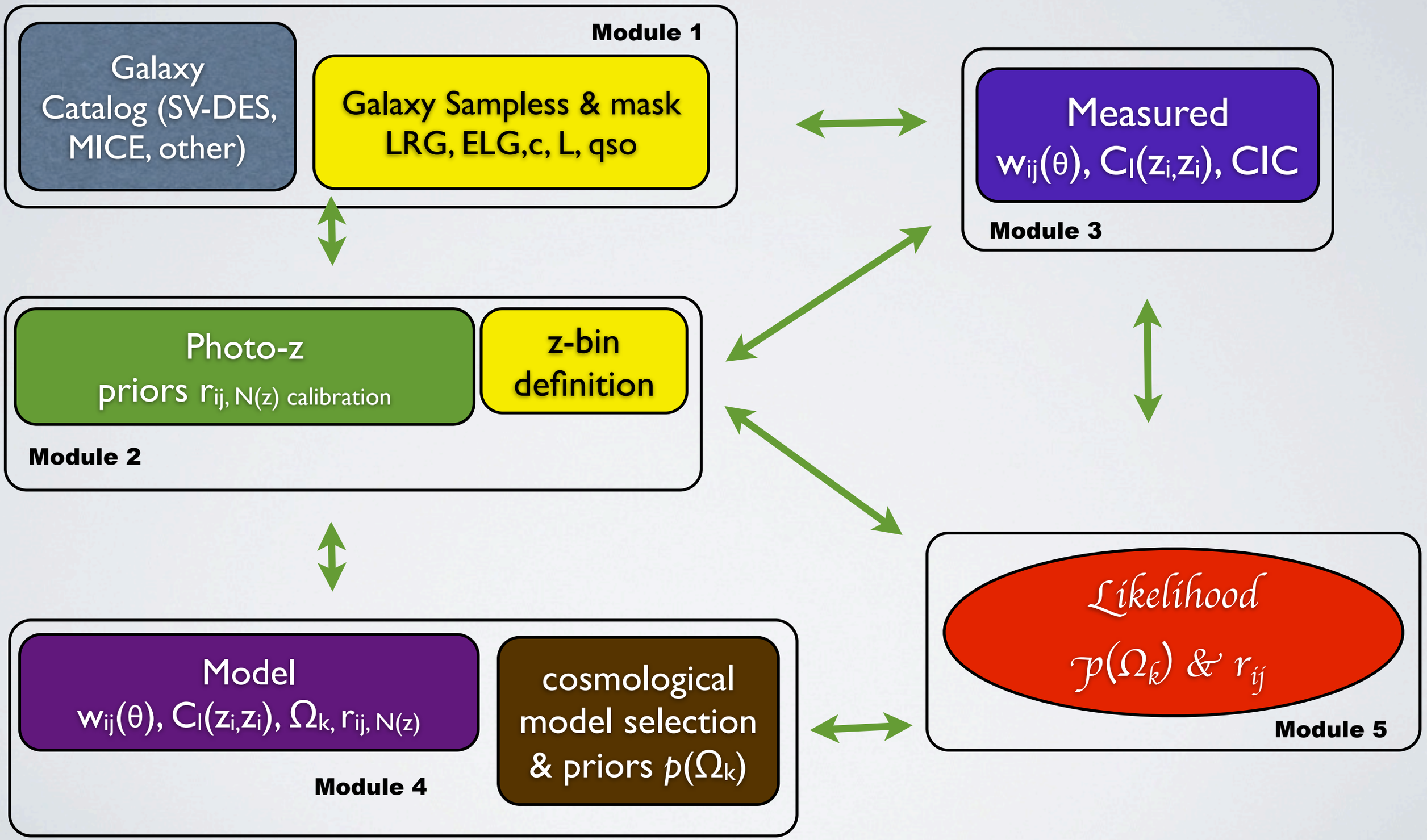
DARK ENERGY SURVEY

An end-to-end pipeline for cosmological analysis

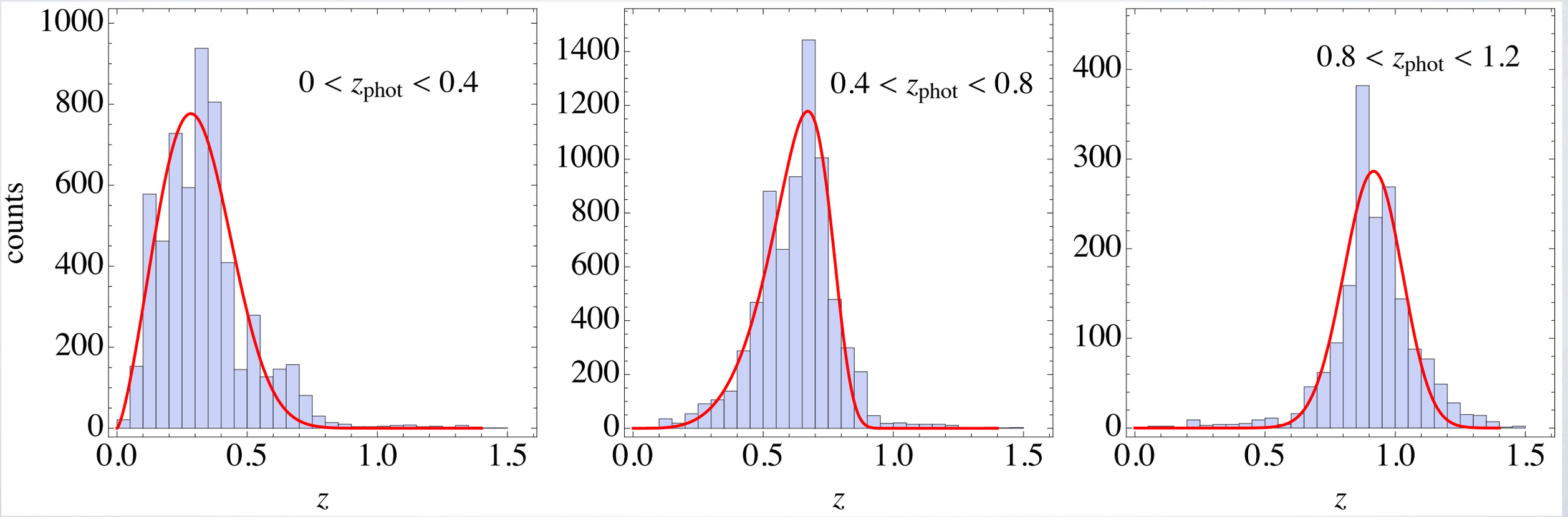


Clustering analysis in the 4 calibration fields

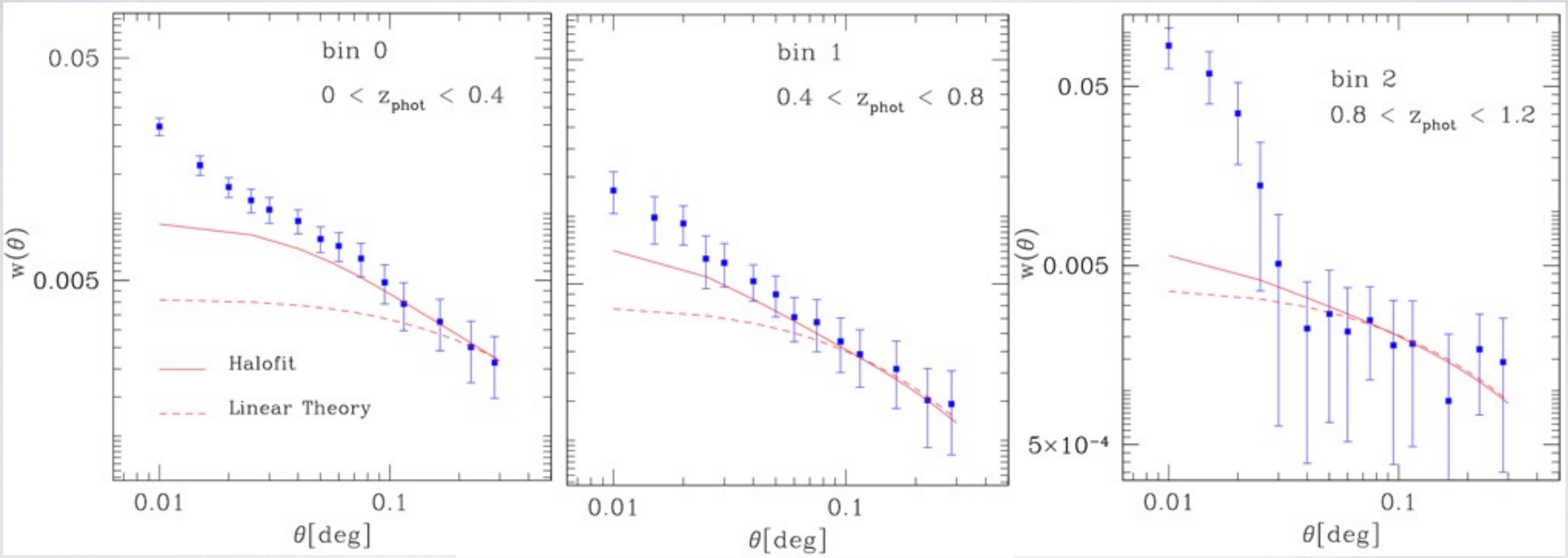
- VVDS Deep 02hr
- CDFS
- VVDS Deep 14hr
- Cosmos

➤ Roughly 1 sq deg each field and 500,000 objects
➤ Mag limit selection (18 < i_mag_auto < 24) and star-gal separation (spread_model > 0.002)
➤ We run 2 different photo-z codes ANNz and BPZ

BPZ results : redshift distributions in 3 bins

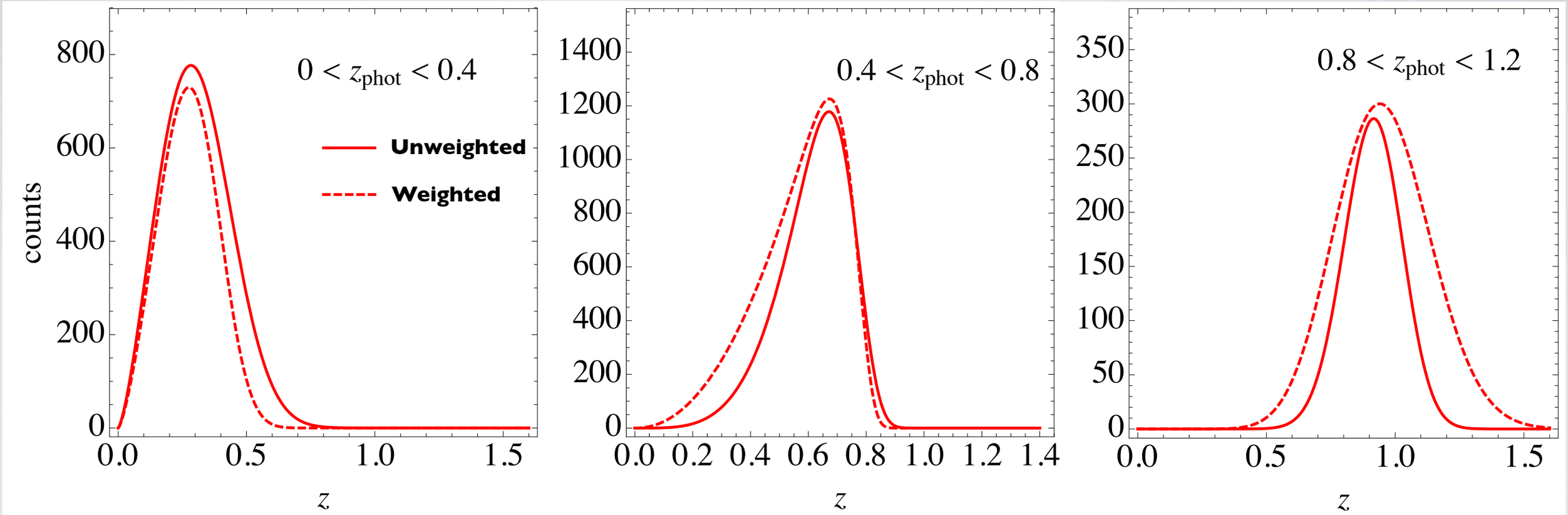


BPZ results : small scale clustering in 3 bins

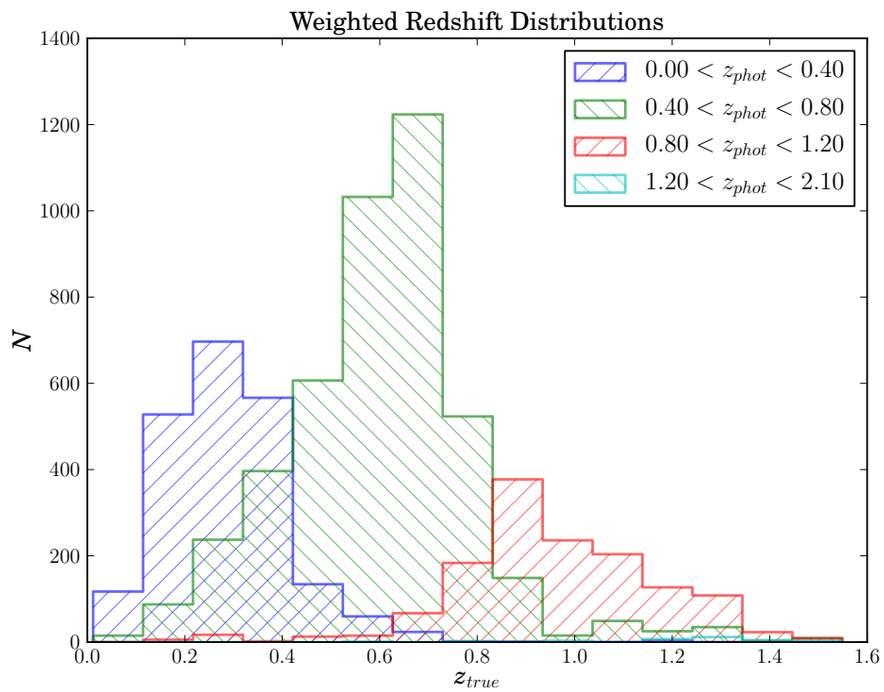


➤ Nonlinear Effects start to kick in at least at 0.1 deg, the clustering excess over the model towards smaller angles could be due to nonlinear biasing, systematics, ..

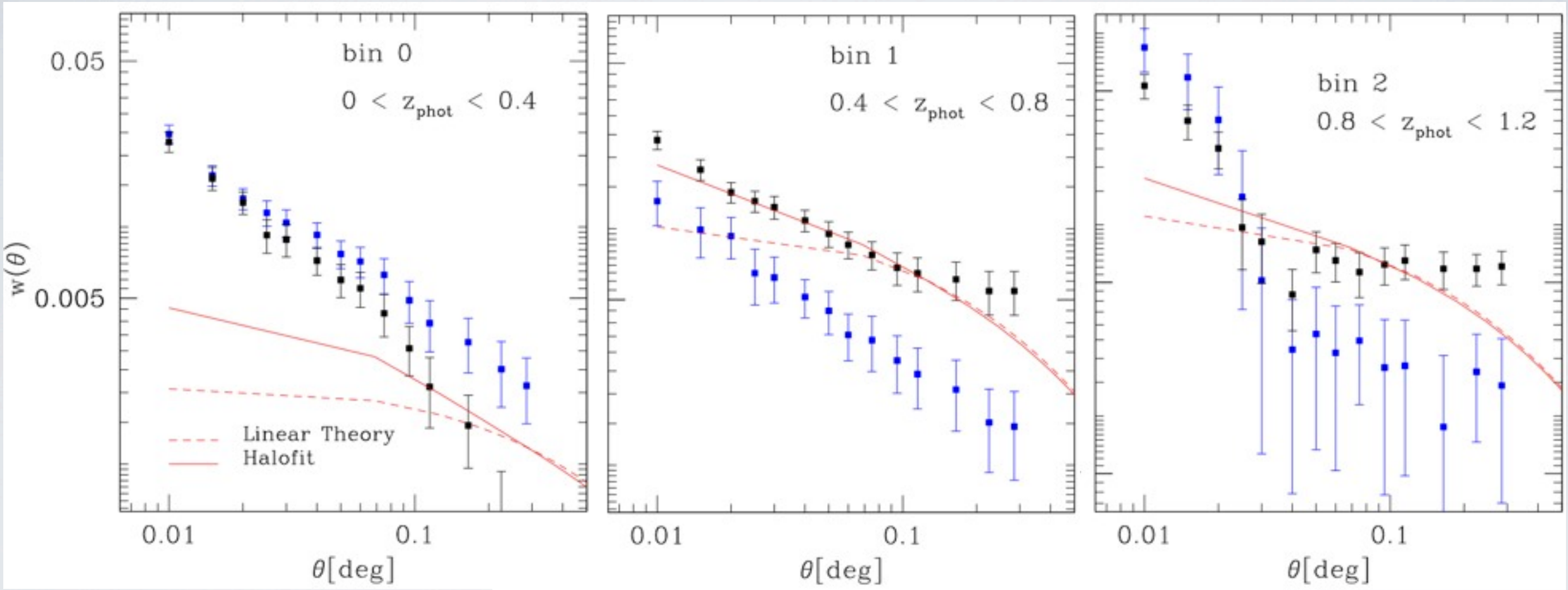
ANNz : weight the spectroscopic sample to estimate N(z)



➤ Distributions are broader (but more realistic photo-z)



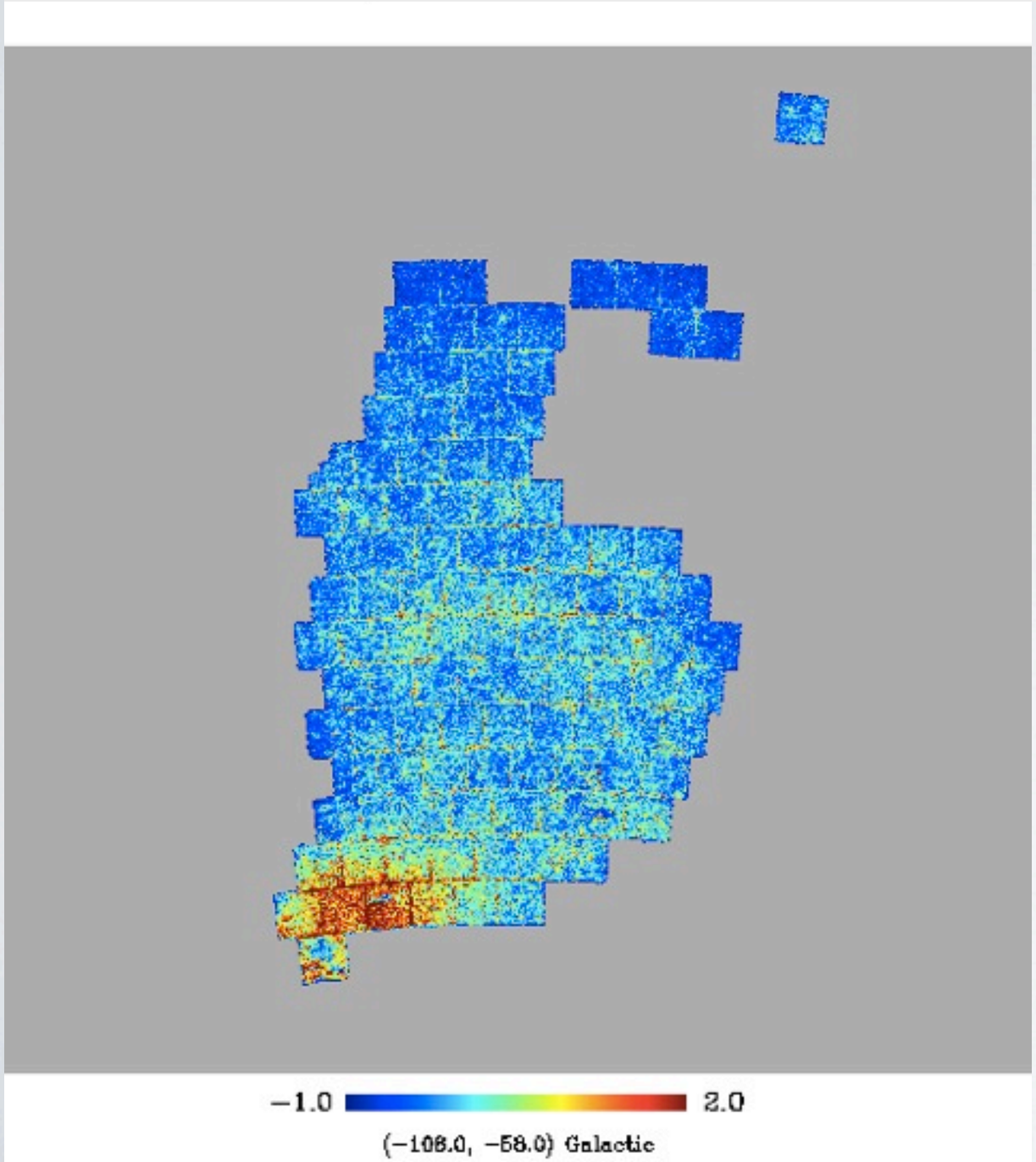
ANNz & BPZ results : small scale clustering in 3 bins

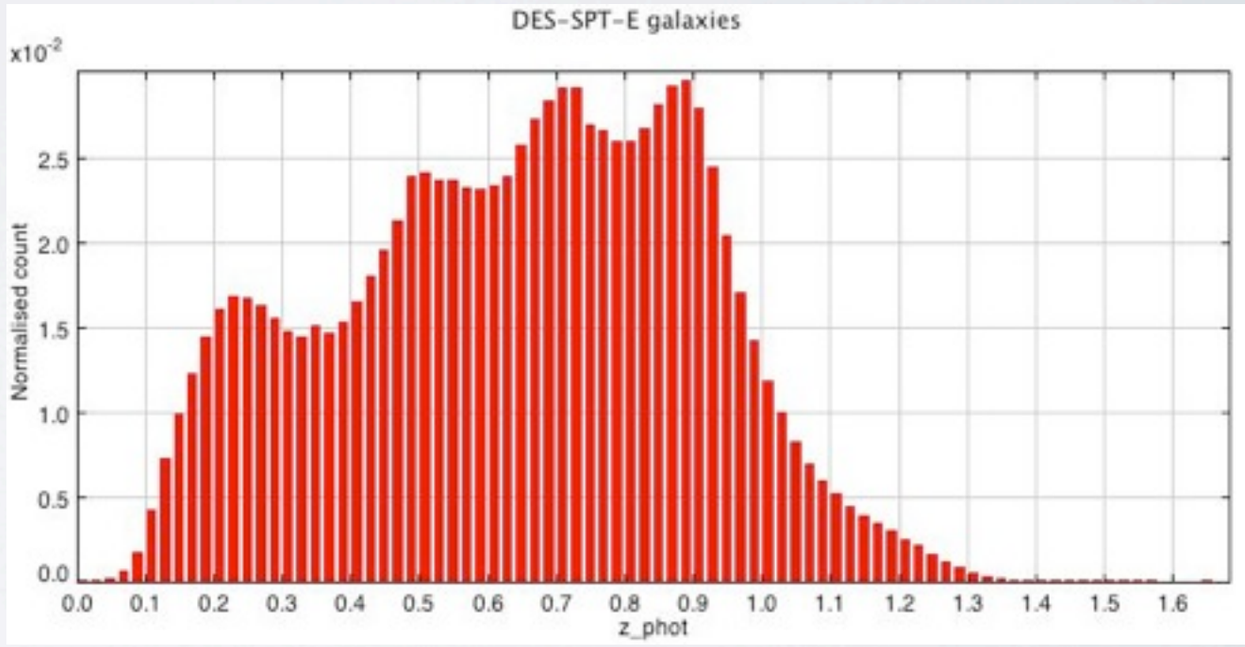


- Black symbols are ANNz , Blue same BPZ (as previous slides)
- A useful comparison; clearly shows problems in the data and/or reduction.

Clustering analysis in SPT-E field

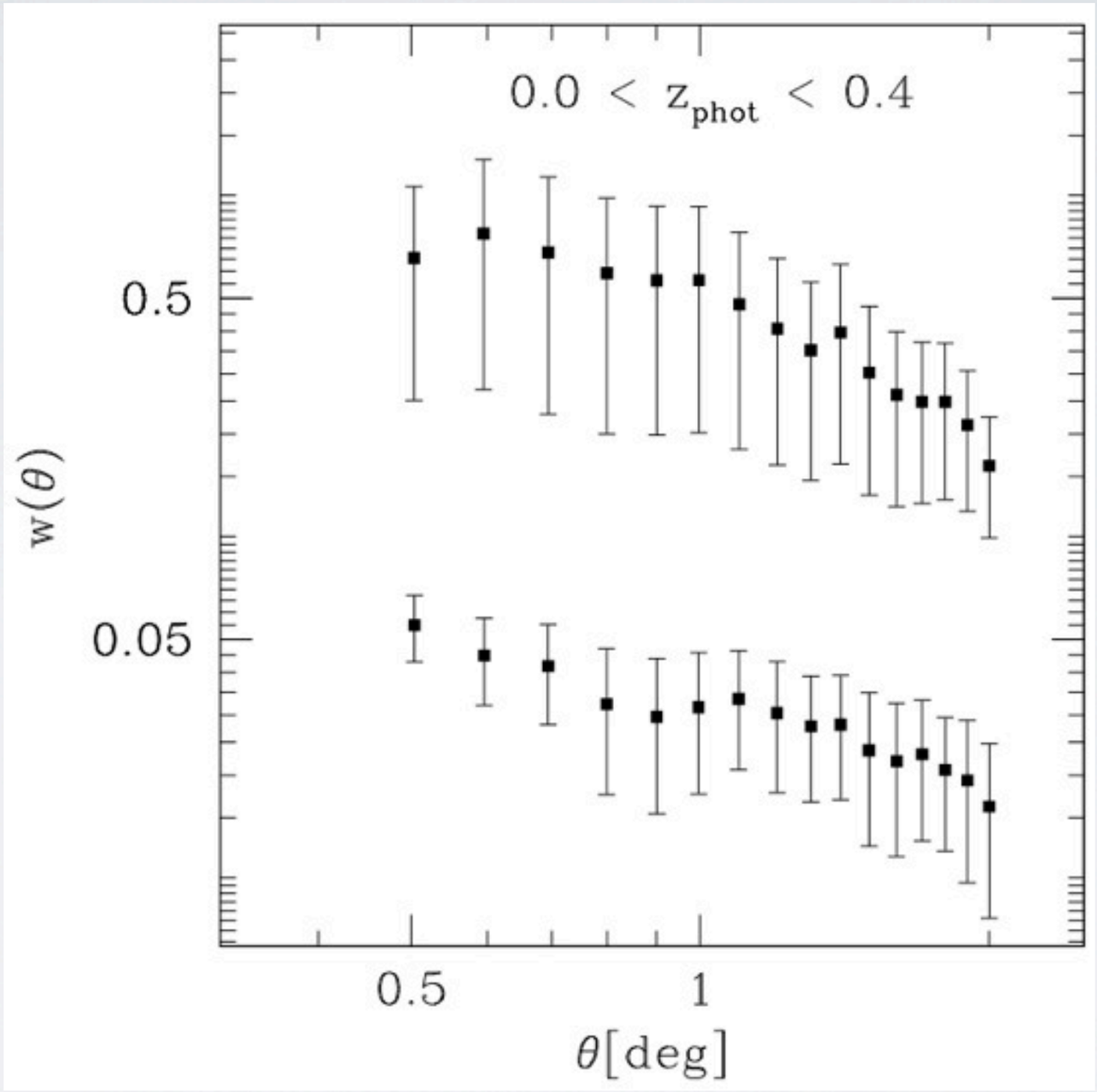
- Similar selection as before (i_mag_auto<24, and i_spread > 0.002), 1.4 million objects
- Notice the crowded source contamination at DEC < -60. This is probably due to stars from the LMC, a problem for low-z co-adds





ANNZ results

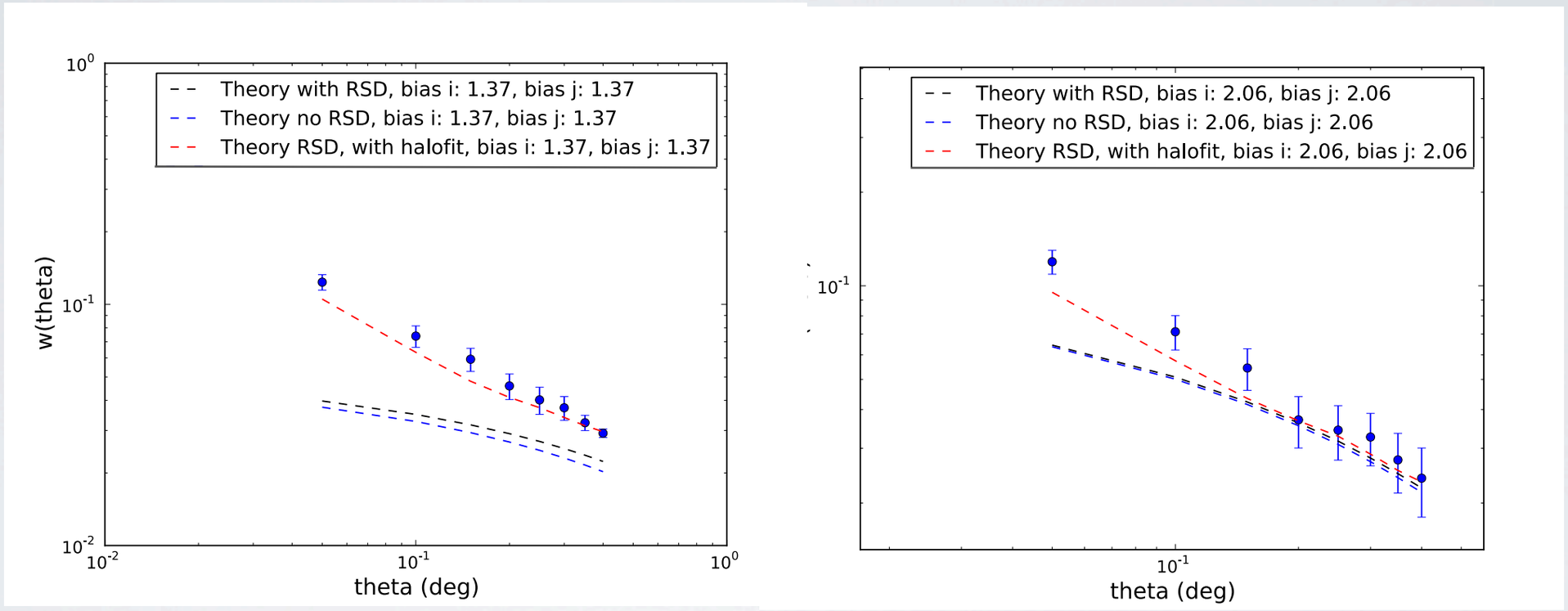
➤ Impact on Clustering for low-z bin



Clustering analysis in SPT-E field

cutting out the DES < -61 region

Autocorrelations of bins 0<z<0.4, 0.4<z<0.8

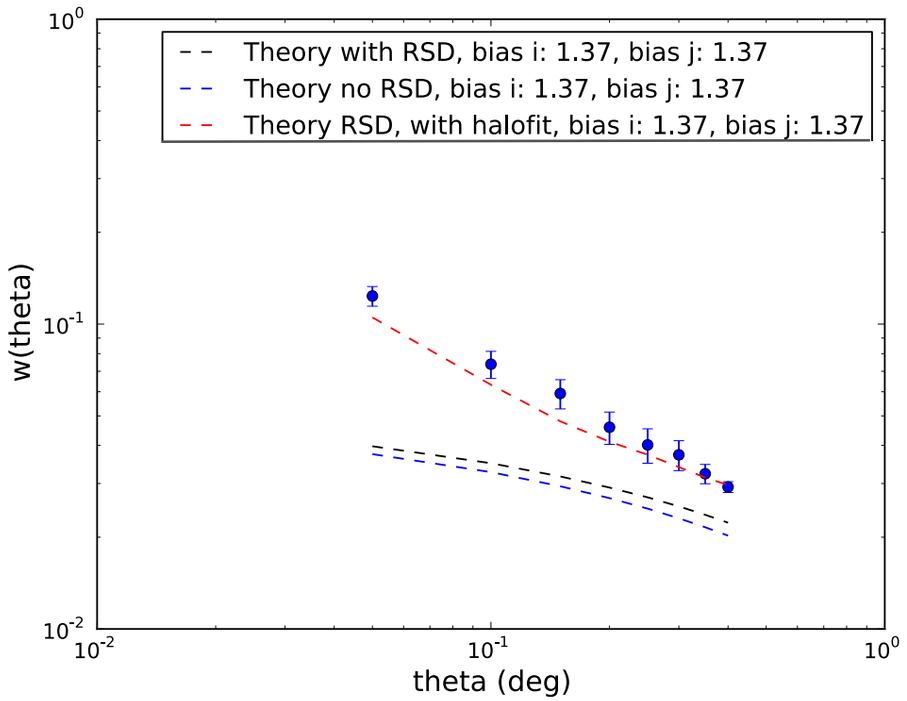


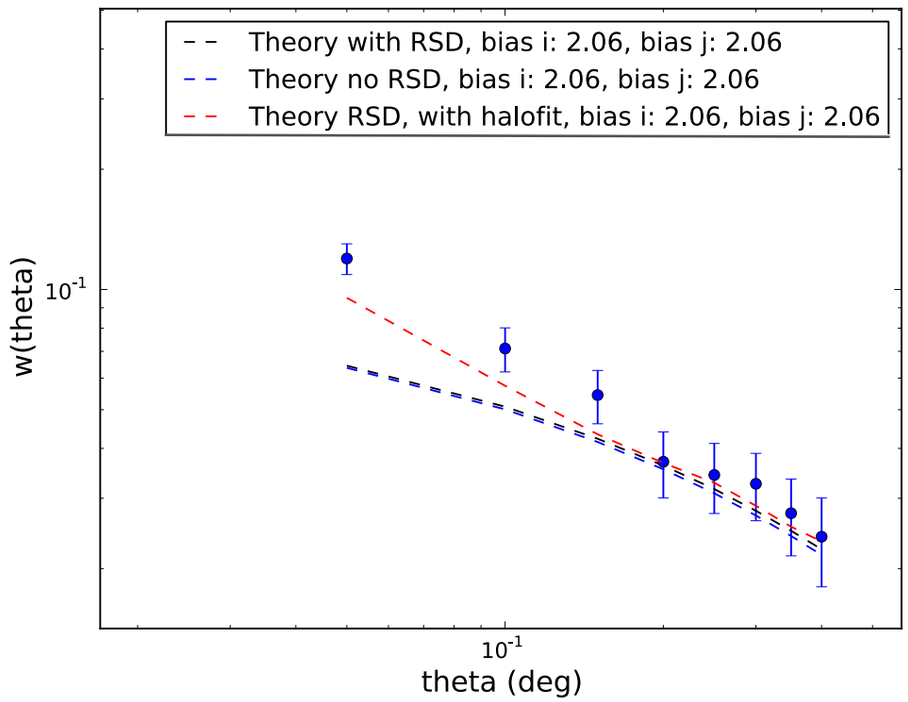
- No training set in the field
- Are the best-fit biases reasonable?

Cross-correlations

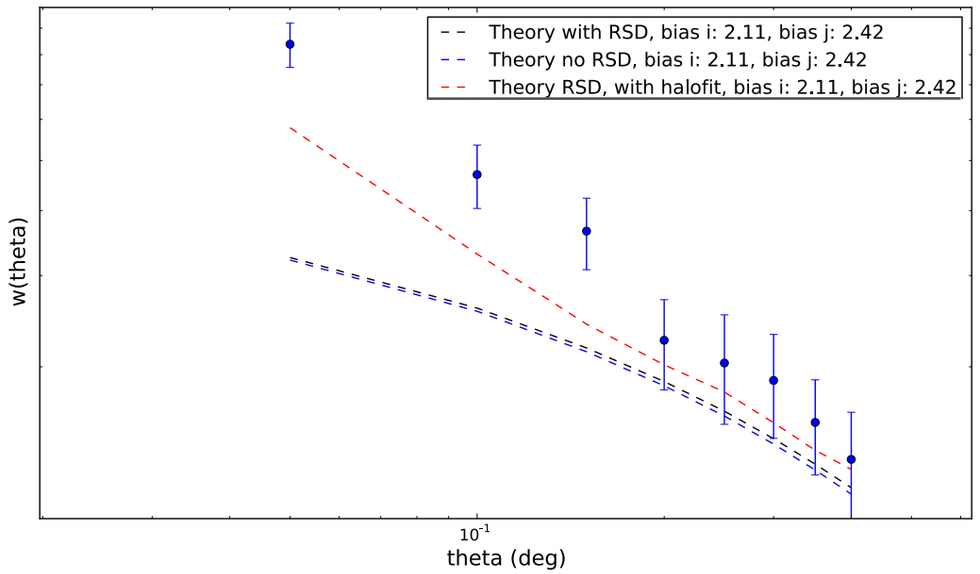
SPT-E region (dec>-61), z 0.0-0.4 vs. 0.4-0.8, BPZ

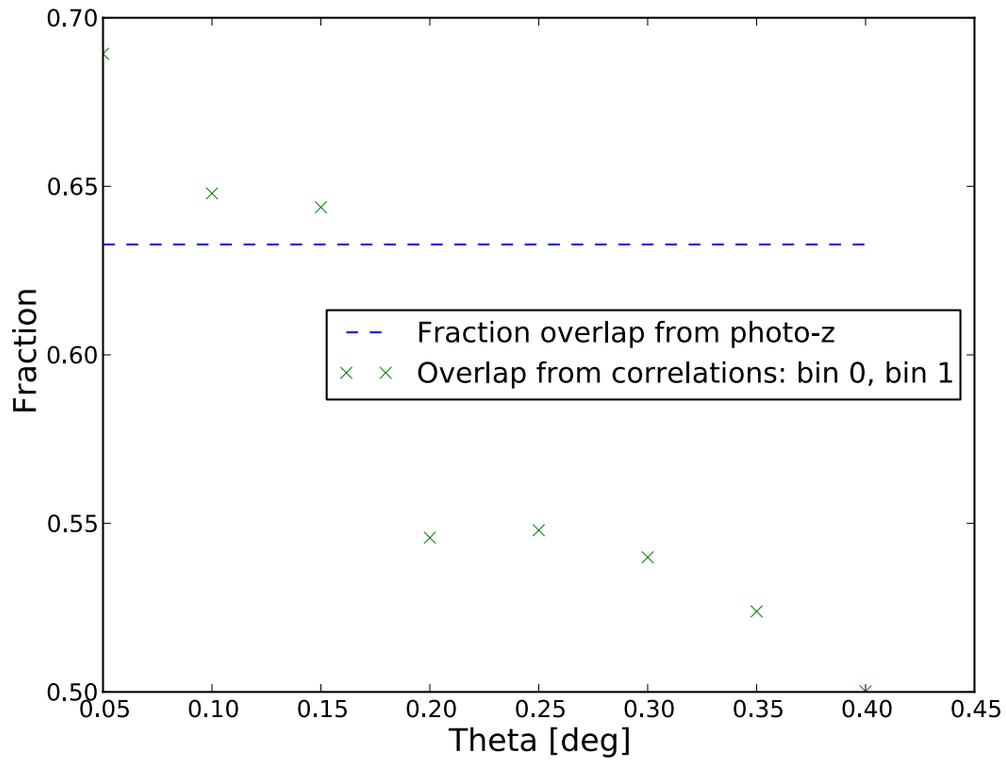
Autocorrelations bin 0 & 1





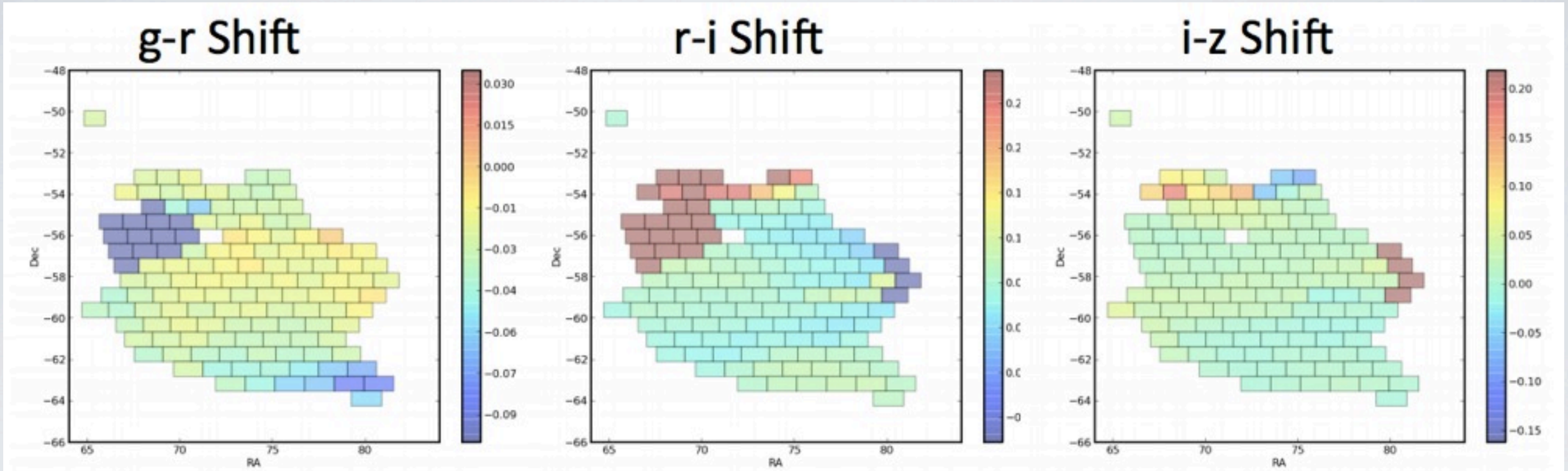
Cross-correlation bin 0 with 1





Clustering analysis in SPT-E field

effects of calibration: stellar locus measurements



From Bob Armstrong's Talk, Calibration session on Tuesday

- Color shifts of a few percent → Trouble in our mag-limited samples!

Summary

- We have been studying the SV fields
  - Good to compare the 4 calibration fields with the SPT-E
- Developing an analysis pipeline: photo-z, clustering measurement, modeling, likelihood
  - Now at prototype stage
- Data are not like simulations!
  - Need to understand the "features" & make more quality cuts
  - Should give feedback to the DESDM people this spring, before next reduction run.